

WHAT IS CLAIMED IS:

1. A silver halide photographic emulsion which contains at least two sensitizing dyes represented by the following formula (I):

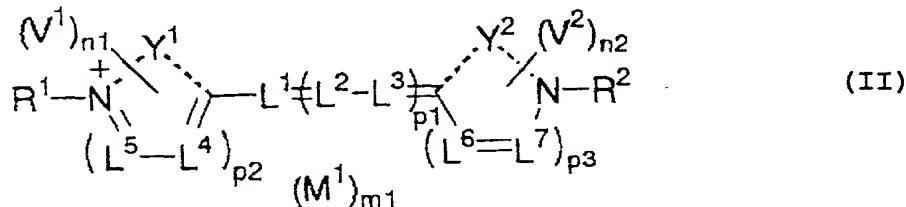


wherein Dye represents a dye moiety; A represents a linking group; Q represents a dissociable group; r represents 0 or 1; q represents an integer of 2 or more, provided that at least one Q represents  $-\text{SO}_3\text{H}$  and at least one Q represents a dissociable group other than  $-\text{SO}_3\text{H}$ ; M represents a counter ion; and m represents a number of 0 or more necessary to neutralize the electric charge in the molecule, and when m represents 2 or more, M's need not be the same.

2. The silver halide photographic emulsion as claimed in claim 1, wherein the dissociable group other than  $-\text{SO}_3\text{H}$  is selected from the group consisting of  $-\text{COOH}$ ,  $-\text{CONHSO}_2\text{R}$ ,  $-\text{SO}_2\text{NHCOR}$ ,  $-\text{SO}_2\text{NHSO}_2\text{R}$ ,  $-\text{CONHCOR}$ ,  $-\text{OSO}_3\text{H}$ ,  $-\text{PO}(\text{OH})_2$ ,  $-\text{OPO}(\text{OH})_2$ ,  $-\text{B}(\text{OH})_2$ ,  $-\text{OB}(\text{OH})_2$ ,  $-\text{ArOH}$ , and  $-\text{ArSH}$ , wherein R represents an alkyl group, an aryl group, a heterocyclic group, an alkoxyl group, an aryloxy group, a heterocyclic oxy group, or an amino group, and Ar represents an arylene group.

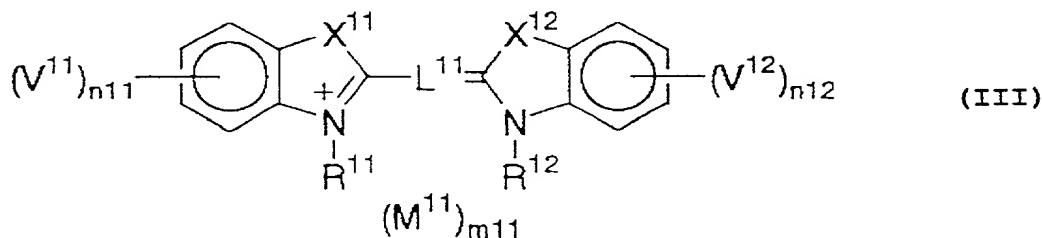
3. The silver halide photographic emulsion as claimed in claim 1, wherein said sensitizing dyes are cyanine dyes.

4. The silver halide photographic emulsion as claimed in claim 1, wherein said sensitizing dyes are represented by the following formula (II):

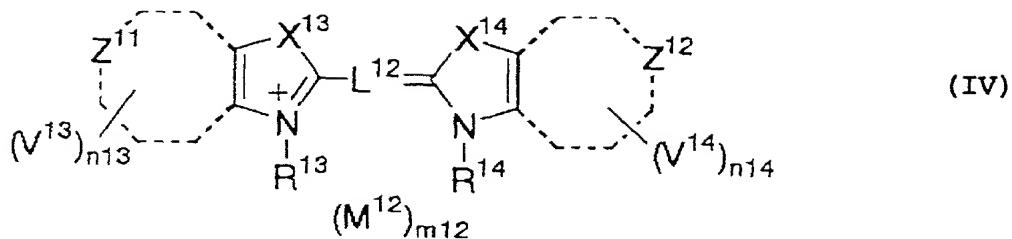


wherein R<sup>1</sup> and R<sup>2</sup> each represents a substituted alkyl, aryl or heterocyclic group, and R<sup>1</sup> is substituted with -SO<sub>3</sub>H and R<sup>2</sup> is substituted with a dissociable group other than -SO<sub>3</sub>H; V<sup>1</sup> and V<sup>2</sup> each represents an atomic group necessary to form a 5- or 6-membered nitrogen-containing heterocyclic ring, and V<sup>1</sup> and V<sup>2</sup> may be condensed with other carbocyclic ring or heterocyclic ring; L<sup>1</sup> and L<sup>2</sup> each represents a substituent; n<sup>1</sup> and n<sup>2</sup> each represents an integer of 0 or more, and when n<sup>1</sup> and n<sup>2</sup> each represents 2 or more, V<sup>1</sup> and V<sup>2</sup> may be the same with or different from each other; L<sup>3</sup>, L<sup>4</sup>, L<sup>5</sup>, L<sup>6</sup> and L<sup>7</sup> each represents a methine group; p<sup>1</sup> represents 0, 1, 2 or 3, p<sup>2</sup> and p<sup>3</sup> each represents 0 or 1, and when p<sup>1</sup> represents 2 or 3, repeating L<sup>2</sup> and L<sup>3</sup> may be the same with or different from each other; M<sup>1</sup> represents a counter ion; and m<sup>1</sup> represents a number of 0 or more necessary to neutralize the electric charge in the molecule.

5. The silver halide photographic emulsion as claimed in claim 1, wherein at least one sensitizing dye is represented by the following formula (III) and at least one sensitizing dye is represented by formula (IV):



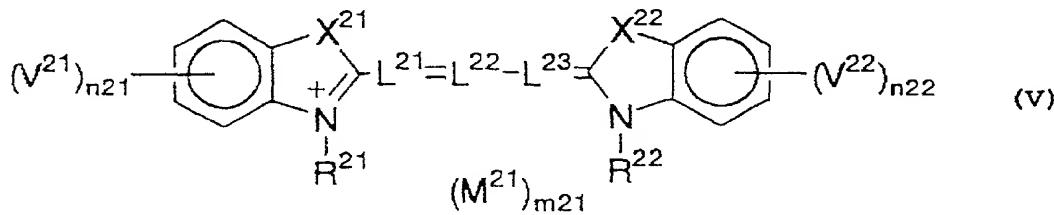
wherein  $R^{11}$  and  $R^{12}$  each represents a substituted alkyl, aryl or heterocyclic group, and  $R^{11}$  is substituted with  $-SO_3H$  and  $R^{12}$  is substituted with a dissociable group other than  $-SO_3H$ ;  $X^{11}$  and  $X^{12}$  each represents an oxygen atom, a sulfur atom, a selenium atom,  $NR^{15}$ ,  $CR^{16}R^{17}$ , or  $L^{13}=L^{14}$ ;  $R^{15}$ ,  $R^{16}$  and  $R^{17}$  each represents a substituted or unsubstituted alkyl, aryl or heterocyclic group;  $L^{13}$  and  $L^{14}$  each represents a methine group;  $V^{11}$  and  $V^{12}$  each represents a substituent;  $n^{11}$  and  $n^{12}$  each represents an integer of 0 or more, and when  $n^{11}$  and  $n^{12}$  each represents 2 or more,  $V^{11}$  and  $V^{12}$  may be the same with or different from each other;  $L^{11}$  represents a methine group;  $M^{11}$  represents a counter ion; and  $m^{11}$  represents a number of 0 or more necessary to neutralize the electric charge in the molecule;



wherein  $R^{13}$  and  $R^{14}$  each represents a substituted alkyl, aryl or heterocyclic group, and at least one of  $R^{13}$  and  $R^{14}$  is substituted with  $-SO_3H$  and the other is substituted with a dissociable group other than  $-SO_3H$ ;  $X^{13}$  and  $X^{14}$  each represents an oxygen atom, a sulfur atom, a selenium atom,  $NR^{18}$ ,  $CR^{19}R^{20}$ , or  $L^{15}=L^{16}$ ;  $R^{18}$ ,  $R^{19}$  and  $R^{20}$  each represents a substituted or unsubstituted alkyl, aryl or heterocyclic group;  $L^{15}$  and  $L^{16}$  each represents a methine group;  $Z^{11}$  represents a benzene ring or a naphthalene ring;  $Z^{12}$  represents a naphthalene ring;  $V^{13}$  and  $V^{14}$  each represents a substituent;  $n^{13}$  and  $n^{14}$  each represents an integer of 0 or more, and when  $n^{13}$  and  $n^{14}$  each represents 2 or more,  $V^{13}$  and  $V^{14}$  may be the same with or different from each other;  $L^{12}$  represents a methine group;  $M^{12}$  represents a counter ion; and  $m^{12}$  represents a number of 0 or more necessary to neutralize the electric charge in the molecule.

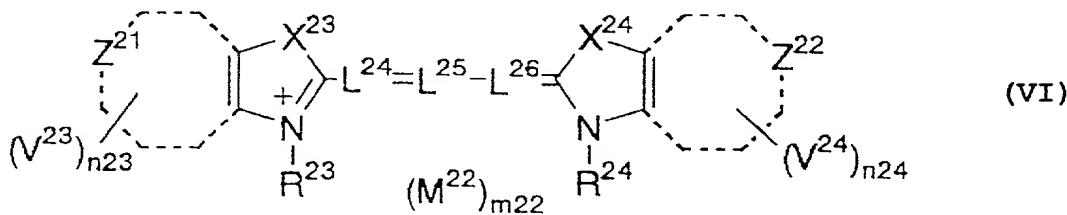
6. The silver halide photographic emulsion as claimed in claim 5, wherein the dissociable group other than  $-\text{SO}_3\text{H}$  is selected from the group consisting of  $-\text{COOH}$ ,  $-\text{CONHSO}_2\text{R}$ ,  $-\text{SO}_2\text{NHCOR}$ ,  $-\text{SO}_2\text{NHSO}_2\text{R}$ , and  $-\text{CONHCOR}$ , wherein R represents an alkyl group, an aryl group, a heterocyclic group, an alkoxy group, an aryloxy group, a heterocyclic oxy group, or an amino group.

7. The silver halide photographic emulsion as claimed in claim 1, wherein at least one sensitizing dye is represented by the following formula (V) and at least one sensitizing dye is represented by formula (VI) :



wherein  $\text{R}^{21}$  and  $\text{R}^{22}$  each represents a substituted alkyl, aryl or heterocyclic group, and at least one of  $\text{R}^{21}$  and  $\text{R}^{22}$  is substituted with  $-\text{SO}_3\text{H}$  and the other is substituted with a dissociable group other than  $-\text{SO}_3\text{H}$ ;  $\text{X}^{21}$  and  $\text{X}^{22}$  each represents an oxygen atom, a sulfur atom, a selenium atom,  $\text{NR}^{25}$ ,  $\text{CR}^{26}\text{R}^{27}$ , or  $\text{L}^{27}=\text{L}^{28}$ ;  $\text{R}^{25}$ ,  $\text{R}^{26}$  and  $\text{R}^{27}$  each represents a substituted or unsubstituted alkyl, aryl or heterocyclic group;  $\text{L}^{27}$  and  $\text{L}^{28}$  each represents a methine group;  $\text{V}^{21}$  and  $\text{V}^{22}$  each represents a substituent;  $\text{n}^{21}$  and  $\text{n}^{22}$  each represents an integer of 0 or more, and when  $\text{n}^{21}$  and  $\text{n}^{22}$  each

represents 2 or more,  $V^{21}$  and  $V^{22}$  may be the same with or different from each other;  $L^{21}$ ,  $L^{22}$  and  $L^{23}$  each represents a methine group;  $M^{21}$  represents a counter ion; and  $m^{21}$  represents a number of 0 or more necessary to neutralize the electric charge in the molecule;



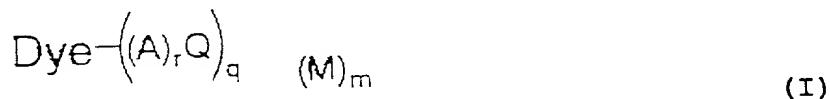
wherein  $R^{23}$  and  $R^{24}$  each represents a substituted alkyl, aryl or heterocyclic group, and at least one of  $R^{23}$  and  $R^{24}$  is substituted with  $-SO_3H$  and the other is substituted with a dissociable group other than  $-SO_3H$ ;  $X^{23}$  and  $X^{24}$  each represents an oxygen atom, a sulfur atom, a selenium atom,  $NR^{28}$ ,  $CR^{29}R^{30}$ , or  $L^{29}=L^{30}$ ;  $R^{28}$ ,  $R^{29}$  and  $R^{30}$  each represents a substituted or unsubstituted alkyl, aryl or heterocyclic group;  $L^{29}$  and  $L^{30}$  each represents a methine group;  $Z^{21}$  represents a benzene ring or a naphthalene ring;  $Z^{22}$  represents a naphthalene ring;  $V^{23}$  and  $V^{24}$  each represents a substituent;  $n^{23}$  and  $n^{24}$  each represents an integer of 0 or more, and when  $n^{23}$  and  $n^{24}$  each represents 2 or more,  $V^{23}$  and  $V^{24}$  may be the same with or different from each other;  $L^{24}$ ,  $L^{25}$  and  $L^{26}$  each represents a methine group;  $M^{22}$  represents a counter ion; and  $m^{22}$  represents a number of 0 or more necessary to neutralize the electric charge in the molecule.

8. The silver halide photographic emulsion as claimed in claim 7, wherein the dissociable group other than  $-\text{SO}_3\text{H}$  is selected from the group consisting of  $-\text{COOH}$ ,  $-\text{CONHSO}_2\text{R}$ ,  $-\text{SO}_2\text{NHCOR}$ ,  $-\text{SO}_2\text{NHSO}_2\text{R}$ , and  $-\text{CONHCOR}$ , wherein R represents an alkyl group, an aryl group, a heterocyclic group, an alkoxy group, an aryloxy group, a heterocyclic oxy group, or an amino group.

9. The silver halide photographic emulsion as claimed in claim 1, wherein 50% or more of the entire projected area of the silver halide grains in said emulsion is accounted for by tabular grains having an aspect ratio of 2 or more.

10. The silver halide photographic emulsion as claimed in claims 1, wherein said emulsion is chemically sensitized with a selenium sensitizer.

11. A silver halide photographic material which comprises a support having provided thereon at least one emulsion layer containing the silver halide photographic emulsion which contains at least two sensitizing dyes represented by the following formula (I):



wherein Dye represents a dye moiety; A represents a linking group; Q represents a dissociable group; r represents 0 or 1; q represents an integer of 2 or more, provided that at least one Q represents  $-\text{SO}_3\text{H}$

and at least one Q represents a dissociable group other than  $-\text{SO}_3\text{H}$ ;  
M represents a counter ion; and m represents a number of 0 or  
more necessary to neutralize the electric charge in the molecule,  
and when m represents 2 or more, M's need not be the same.